

CLAIMS

The embodiments of the invention in which an exclusive property or right is claimed are defined as follows. Having thus described the invention 5 what is claimed is:

1. A sensor apparatus, said apparatus comprising:
  - 10 a base located proximate to a cover;
  - 15 a sensor element located on said base, wherein said cover and said base form a clearance between said cover and said base; and
  - 20 a sensor diaphragm and a dimple formed from and incorporated into said cover, wherein said dimple is in intimate contact with said sensor element at all pressure levels and temperatures thereof.
2. The apparatus of claim 1 wherein said sensor diaphragm comprises a pressure transducer sensor diaphragm.
- 25 3. The apparatus of claim 1 wherein said sensor element comprises quartz.
4. The apparatus of claim 1 wherein said sensor element comprises ceramic.
- 25 5. The apparatus of claim 1 wherein said sensor element comprises silicon.
- 30 6. The apparatus of claim 1 wherein said sensor apparatus comprises a pressure sensor.

7. The apparatus of claim 6 wherein said pressure sensor comprises a surface acoustic wave (SAW) pressure sensor.
8. The apparatus of claim 1 wherein said cover is soldered to said base when said cover is assembled to said base.
9. The apparatus of claim 1 wherein said cover is welded to said base when said cover is assembled to said base.
10. 10. A surface acoustic wave (SAW) pressure sensor apparatus, said apparatus comprising:
  - a base located proximate to a cover;
  - 15 a SAW sensor element comprising a sense element located on said base, wherein said cover and said base form a clearance between said cover and said base; and
  - 20 a pressure transducer sensor diaphragm incorporated into said cover, wherein said pressure transducer sensor diaphragm contains a dimple that is also incorporated into said cover, wherein said dimple is in intimate contact with said SAW sensor element at all pressure levels and temperatures thereof.
- 25 11. A method for forming a sensor, said method comprising the steps of:
  - locating a base proximate to a cover;
  - 30 positioning a sensor element on said base;
  - forming a clearance between said cover and said base; and

incorporating a sensor diaphragm and a dimple into said cover, wherein said dimple is in intimate contact with said sensor element at all pressure levels and temperatures thereof.

5 12. The method of claim 11 wherein said sensor diaphragm comprises a pressure transducer sensor diaphragm.

13. The method of claim 11 wherein said sensor element comprises quartz.

10 14. The method of claim 11 wherein said sensor element comprises ceramic.

15 15. The method of claim 11 wherein said sensor element comprises silicon.

16. The method of claim 11 wherein said sensor apparatus comprises a pressure sensor.

20 17. The method of claim 16 wherein said pressure sensor comprises a surface acoustic wave (SAW) pressure sensor.

18. The method of claim 11 further comprising the step of soldering said cover to said base when said cover is assembled to said base.

25 19. The method of claim 11 further comprising the step of welding said cover to said base when said cover is assembled to said base.

20. A method for forming a surface acoustic wave (SAW) pressure sensor apparatus, said method comprising the steps of:

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locating a base proximate to a cover;

positioning a SAW sensor element comprising a sense element on said base, wherein said cover and said base form a clearance between said cover and said base; and

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incorporating a pressure transducer sensor diaphragm into said cover, wherein said pressure transducer sensor diaphragm contains a dimple that is also incorporated into said cover, wherein said dimple is in intimate contact with said SAW sensor element at all pressure levels and temperatures  
10 thereof.